


ADDENDUM

Prepared by: Lon Levin and Mike Ward, 
American Mobile Satellite Corporation
Re: Elements of a Consensus
Date: April 6, 1993

Attached as an addendum to the Report of the MSS Above 1 GHz Negotiated Rulemaking Committee are documents concerning the "Elements of a Consensus" approach.

Documents:

3/24/93	Proposal
3/24/93	Viewgraphs
3/25/93	Proposal
3/25/93	Viewgraphs
3/30/93	Comments
3/30/93	Proposal
3/31/93	Viewgraphs

March 24, 1993 Proposal

March 24, 1993

Elements of a Consensus

Guiding Principles:

Equity - All applicants have the opportunity to implement their proposed systems.

Public Interest - Public access to service. Universal coverage with maximum competition. No set asides for never-to-be implemented systems.

Market Driven - Each proponent can pursue its own business plan with no external prejudgment as to risk or technical approach. The market place decides if the approach is correct.

International Interests - Mechanism for taking account of non- U.S. systems and the international coordination of U.S. systems.

Approach:

1. All systems but Iridium are built to operate across the MSS bands in the uplink and downlink direction. Motorola should build to operate in the downlink throughout the 1613.8-1626.5 MHz band on a secondary basis and in the band 1610-1626.5 MHz in the uplink direction.

2. All systems will be licensed in the uplink direction across the band 1610-1626.5 MHz. All CDMA systems will be licensed across the 2483.5-2500 MHz downlink band. Motorola will be licensed in the downlink on a secondary basis in the band 1613.8-1626.5 MHz.

3. The conditional license does not confer the right to use the spectrum across the entire band in the U.S. Coordination will be required with all U.S. operators and other foreign satellite operators. The license authorizes the applicants to construct and to launch a satellite system.

4. The 1610-1616.0 MHz band is made available when the operators require more spectrum after operation and the sharing issues with the Glonass systems have been resolved.

5. Establish a FCC recognized standing committee of all operators that have received a license, have launched satellites and/or are operating. This committee will make by mutual agreement under prescribed conditions the actual U.S. domestic frequency assignments to the satellite systems as they are launched. (See 8 below.)

6. This standing committee will also be used as the forum to coordinate the use of the spectrum by these U.S. systems around the World. It is expected that the requirements of each U.S. system will vary around the world and this committee will be used to determine the amount of spectrum assignments to be used by each of these systems around the world.

7. The standing committee will develop proposals to solve interference issues with other administration's satellite systems operating in this band. These

proposals will be used by the FCC to coordinate the use of the spectrum with the U.S. Government and other administration's systems whether satellite or terrestrial services. However, the FCC remains the focal point for ITU coordination discussions with other administrations and with the U.S. Government.

8. The 10.5 MHz (1616-1626.5 MHz) would be assigned to the satellite operators when they launch their systems. If all six applicants launch, each will be guaranteed a minimum of 10.5/6 MHz in the United States subject to the appropriate coordination with any other administration's systems. More spectrum will be available if some systems do not launch.

a. The first system launched and fully operating (all satellites launched) gets the entire band of spectrum at its own risk.

b. When the second system is launched, the band (10.5 MHz) is split in half, when both systems are operational. If one is FDMA, it will operate in the upper 5.25 MHz. The CDMA system will operate in the lower 5.25 MHz.

c. If a third system is launched and is operational, the partition moves to a third (10/3) of the spectrum for each system. If there is one FDMA system with two CDMA systems, the CDMA systems could pool the 2/3 of 10.5 MHz.

d. Each system gets a minimum amount of $(10.5/n)$ MHz where n is equal or less than 6) to use until they become fully operational over the United States. Each system will have to demonstrate that its system is fully operational to the coordinating committee and can provide service to the United States for some $x\%$ of time as indicated in their applications. They will have [three] years to become fully operational after initial launch. At full operation $10.5/m$ MHz is available to each of the M operational systems where $M \leq N$.

e. If a second round of applications is permitted, the number of licensees could increase, but the maximum number of licensees operational would be $n < \text{or} =$ to [6, 7, 8 or 9] ?

f. Access to additional spectrum depends upon the usage of its existing spectrum assignment. Some formula can be developed to reapportion spectrum to be commensurate with usage over time.

9. The 1610-1616 MHz band could be used by CDMA operators or FDMA operators depending upon how the Glonass issue is resolved. If the total amount of spectrum is increased to 16.5 MHz, it can be shared amongst all of the operators and the FDMA partition could move accordingly. It could be an equal redistribution or an equitable redistribution based on usage.

10. The pool of spectrum used by the CDMA operators could have some equitable sharing of interference power in the uplink and downlink direction as now being considered in the Working groups. The standing committee could determine these values consistent with the ITU Radio Regulations and the operators' ability to seek agreements for values greater than these numbers as outlined by appropriate coordination agreements with other administrations.

11. If a system is unsuccessful using the assigned spectrum within a [6] year period after initial launch the coordination committee would reassign the excess spectrum amongst the other satellite systems in accordance with appropriate usage criteria.

12. The initial and subsequent assignment of spectrum by the standing committee for each satellite system would be notified by the licensee to the FCC.

13. The U.S. government would seek to obtain additional spectrum for mobile satellite allocations at future ITU world radio conferences to satisfy the longer term needs of the MSS operators.

March 24, 1993 Viewgraphs

ELEMENTS OF A CONSENSUS
FOR MSS NRC

GUIDING PRINCIPLES:

- EQUITY - OPPORTUNITY FOR ALL TO IMPLEMENT PROPOSED SYSTEMS
- PUBLIC INTEREST - PUBLIC ACCESS - UNIVERSAL COVERAGE W/MAXIMUM COMPETITION
- MARKET DRIVEN - EACH PROPONENT CAN PURSUE ITS OWN BUSINESS PLAN, W/O EXTERNAL PRE-JUDGMENT AS TO RISK OR TECHNICAL APPROACH, MAXIMIZE MULTIPLE ENTRY, MARKET PLACE DECIDES MERITS.
- INTERNATIONAL INTERESTS - MECHANISM FOR TAKING ACCOUNT OF NON-U.S. SYSTEMS . AND THE INTERNATIONAL COORDINATION OF U.S. SYSTEMS

(2)

APPROACH

DESIGN/BUILD - ALL SYSTEMS TO OPERATE ACROSS FULL MSS UPLINK AND DOWNLINK BANDS.

✓ MOTOROLA - FULL UPLINK BAND: 1610-1626.5 MHZ
DOWNLINK: 1613.8-1626.5 MHZ, SECONDARY BASIS

LICENSING - FULL UPLINK BAND: ALL SYSTEMS, 1610-1626.5 MHZ
✓ DOWNLINK BAND: ALL SYSTEMS, 2483.5-2500 MHZ
EXCEPT MOTOROLA, 1613.8-1626.5 MHZ ON A SECONDARY BASIS

LICENSE - CONDITIONAL, FOR CONSTRUCTION AND LAUNCH.
COORDINATION REQUIRED WITH ALL U.S. OPERATORS AND OTHER
FOREIGN SATELLITE OPERATORS.

APPROACH (CONT.)STANDING COMMITTEE

- FCC RECOGNITION AND OVERSIGHT
- MEMBERS - ALL OPERATORS THAT HAVE RECEIVED LICENSE, LAUNCHED, AND/OR ARE OPERATING
- FUNCTIONS
 - MAKE U.S. DOMESTIC ASSIGNMENTS, BY MUTUAL AGREEMENT, UNDER PRESCRIBED CONDITIONS.
 - FORUM TO COORDINATE USE OF SPECTRUM BY THESE U.S. SYSTEMS AROUND THE WORLD. REQUIREMENTS OF EACH U.S. SYSTEM VARY - COMMITTEE DETERMINES AMOUNT OF SPECTRUM TO BE USED BY EACH AROUND THE WORLD.
 - DEVELOP PROPOSALS TO SOLVE INTERFERENCE ISSUES AROUND THE WORLD. FCC USES PROPOSALS FOR "COORDINATION" WITH OTHER ADMINISTRATIONS AND WITH U.S. GOVERNMENT.
 - DYNAMICALLY MANAGE SPECTRUM ASSIGNMENTS BASED ON USAGE.

APPROACH (CONT.)ASSIGNMENTS

1616-1626.5 MHZ:

FREQUENCY ASSIGNMENTS MADE AT TIME OF LAUNCH

- A. FIRST SYSTEM LAUNCHED AND FULLY OPERATING HAS RIGHT TO USE FULL 10.5 MHZ, BUT AT RISK OF DIMINISHING WHEN OTHER ENTRANTS BECOME OPERATIONAL.
- B. SECOND SYSTEM LAUNCHED AND OPERATIONAL REQUIRES SPECTRUM SPLIT IN HALF (10.5 / 2)
 - FDMA UPPER PORTION
 - CDMA LOWER PORTION
 - 2-CDMA USERS MAY AGREE TO SHARE FULL SPECTRUM
- C. THIRD SYSTEM LAUNCHED AND OPERATIONAL REQUIRES SPECTRUM SPLIT IN THIRDS (10.5 / 3)
 - FDMA REMAINS IN UPPER PORTION
 - CDMA SPECTRUM POOLING MAY OCCUR

D. ETC. FOR ADDITIONAL SYSTEMS

EACH SYSTEM HAS GUARANTEED MINIMUM OF (10.5/N MHZ
WHERE $N \leq 6$) TO USE UNTIL FULLY OPERATIONAL OVER U.S.

FULL OPERATION DEMONSTRATED TO STANDING COMMITTEE.
SERVICE FOR X% OF TIME (AS INDICATED IN APPLICATIONS.)
[THREE] YEARS TO DEMONSTRATE FULL OPERATION
AT FULL OPERATION 10.5/M MHZ AVAILABLE TO EACH OF M
OPERATIONAL SYSTEMS.

E. NUMBER OF LICENSEES, N, COULD INCREASE BY A SECOND ROUND OF
APPLICATIONS. N RESTRICTED TO A MAXIMUM OF [6, 7, 8, OR 9].

F. ACCESS TO ADDITIONAL SPECTRUM

WITHIN 10.5 MHZ BAND - REAPPORTIONMENT BY FORMULA
RELATED TO USAGE OVER TIME. INCREASES AND DECREASES
COULD OCCUR.

WITHIN ADDITIONAL 6 MHZ (1610-1616 MHZ) - SEE NEXT
SECTION

ASSIGNMENTS (CONT.)

1610-1616 MHZ:

USEFULNESS DEPENDS ON GLONASS SHARING ISSUE.

AS SHARING BECOMES POSSIBLE - SHARE AMONG ALL USERS.

FDMA PARTITION MOVES ON THE BASIS OF EQUAL REDISTRIBUTION OR
EQUITABLE REDISTRIBUTION BASED ON USAGE.

CDMA SPECTRUM POOL - EQUITABLE SHARING OF INTERFERENCE POWER IN
UPLINKS AND DOWNLINKS. DETERMINED BY STANDING
COMMITTEE.

REASSIGNMENT OF SPECTRUM - SYSTEMS THAT ARE UNSUCCESSFUL IN USING
ASSIGNED SPECTRUM WITHIN [6] YEARS AFTER
INITIAL LAUNCH WOULD HAVE EXCESS SPECTRUM
REASSIGNED AMONGST THE OTHER SYSTEMS BASED
UPON USAGE CRITERIA.

NOTIFICATION OF ASSIGNMENTS TO THE FCC BY EACH LICENSEE.

(7)

FUTURE EXPANSION

U.S. GOVERNMENT WOULD SEEK ADDITIONAL MSS ALLOCATIONS AT FUTURE WARC'S.

Have enough. Not additional at home.

March 25, 1993 Proposal

March 25, 1993

Elements of a Consensus

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Market Driven - Each proponent can pursue its own business plan with no external prejudgment as to risk or technical approach. The market place decides if the approach is correct.

International Interests - Mechanism for taking account of non- U.S. systems and the international coordination of U.S. systems.

Approach:

1. All systems but Iridium are built to operate across the MSS bands in the uplink and downlink direction. Motorola should build to operate in the downlink throughout the 1613.8-1626.5 MHz band on a secondary basis and in the band 1610-1626.5 MHz in the uplink direction.

2. All systems will be licensed in the uplink direction across the band 1610-1626.5 MHz. All CDMA systems will be licensed across the 2483.5-2500 MHz downlink band. Motorola will be licensed in the downlink on a secondary basis in the band 1613.8-1626.5 MHz.

3. The conditional license does not confer the right to use the spectrum across the entire band in the U.S. Coordination will be required with all U.S. operators and other foreign satellite operators. The license authorizes the applicants to construct and to launch a satellite system.

4. The 1610-1616.0 MHz band is made available when the operators require more spectrum after operation and the sharing issues with the Glonass system have been resolved.

5. Establish a FCC recognized standing committee of all operators that have received a license, have launched satellites and/or are operating. This committee will make by mutual agreement under prescribed conditions the actual U.S. domestic frequency assignments to the satellite systems as they are launched. (See 8 below.)

6. This standing committee will also be used as the forum to coordinate the use of the spectrum by these U.S. systems around the World. It is expected that the requirements of each U.S. system will vary around the world and this committee will be used to determine the amount of spectrum assignments to be used by each of these systems around the world.

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proposals will be used by the FCC to coordinate the use of the spectrum with the U.S. Government and other administration's systems whether satellite or terrestrial services. However, the FCC remains the focal point for ITU coordination discussions with other administrations and with the U.S. Government.

8. The 10.5 MHz (1616-1626.5 MHz) would be assigned to the satellite operators when they launch their systems. If all six applicants launch, each will be guaranteed a minimum of 10.5/6 MHz in the United States subject to the appropriate coordination with any other administration's systems. More spectrum will be available if some systems do not launch.

a. Each system that is launched is guaranteed a minimum amount of 10.5/n MHz (where n is equal or less than 6) to use in the United States at the launch of the first satellite until the system becomes fully operational over the United States. Each operator will have to demonstrate to the standing committee that its system is fully operational and can provide service to the United States for some x % of time as indicated in its application. Each system will have [three] years to become fully operational after initial launch. At full operation, 10.5/m MHz is available to each of the m operational systems where $m \leq n$.

1.) When the first system is launched and fully operational (all satellites launched) is permitted to operate over the entire band of spectrum at its own risk until another system is fully operational.

2.) When the second system is launched and fully operational, the band (10.5 MHz) is split in half. If one is FDMA, it will operate in the upper 5.25 MHz. The CDMA system will operate in the lower 5.25 MHz.

3.) If a third system is launched and is fully operational, the partition moves to a third of the spectrum (10.5/3 MHz) for each system. If there is one FDMA system with two CDMA systems, the CDMA systems could pool the 2/3 of 10.5 MHz.

b. If a second round of applications is permitted, the number of licensees could increase, but the maximum number of licensees operational would be $n < \text{or} =$ to [6, 7, 8 or 9] ?

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12. The U.S. Government would seek to obtain additional spectrum for mobile satellite allocations at future ITU world radio conferences to satisfy the longer term needs of the MSS operators.

March 25, 1993 Viewgraphs

MSSAC-29
March 25, 1993

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FDMA UPPER PORTION

CDMA LOWER PORTION

2-CDMA USERS MAY AGREE TO SHARE FULL SPECTRUM

(5)

A.3 THIRD SYSTEM LAUNCHED AND OPERATIONAL REQUIRES SPECTRUM
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